

Poverty Mapping and Identifying the Hard-core Poor and Poor Group using Geographical Information System

Pemetaan Kemiskinan dan Mengenal Pasti Golongan Miskin dan Kumpulan Miskin Menggunakan Sistem Maklumat Geografi

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ABSTRACT

Poverty reduction is the main agenda of sustainable development in most developing countries. In Malaysia, problems of poverty are addressed through various strategies and programs of the New Economic Policy (1971-1990), National Development Policy (1991-1999) and the National Vision Policy (2000-2010). Currently, Malaysia implements the National Transformation Policy (NTP), in order to move towards a high-income country. Various efforts have been undertaken by the government to overcome the poverty problem with significant success. However, poverty still persist in some states, including the East Coast Economic Region (ECER) comprising of three major east coasts of Kelantan, Terengganu, and Pahang. This study aims to identify the characteristics of hard-core poor and poor in the state of Terengganu through poverty mapping. The study uses secondary data from the Implementation and Coordination Unit (ICU) via e-Kasih portal system consisting of 368 heads of household of the hard-core poor and 7219 poor households in Terengganu registered during the period from 2008 to August 2011. This study used ArcGIS software to map the locality of the hard-core and poor households. The result indicates that the poor are mostly concentrated poverty in Besut and Kuala Terengganu the state capital of Terengganu. Overall, unfavorable characteristics like lower education, more family members and, engage in low paying jobs provide challenges to government agencies to provides proper assistance to them. Policy implications will be discussed to improve the successful implementation of poverty alleviation programs through economic transformation to drive the country to achieve a high income nation, improve the quality of life of people and sustainable development in the state of Terengganu.

Keywords: Hard-core poor; poor; poverty analysis; poverty mapping; GIS; sustainable livelihood

ABSTRAK

Penurunan kemiskinan adalah agenda utama pembangunan mampan di negara-negara membangun. Di Malaysia, masalah kemiskinan dapat ditangani melalui pelbagai strategi dan program seperti Dasar Ekonomi Baru (1971-1990), Dasar Pembangunan Nasional (1991-1999) dan Dasar Wawasan Negara (2000-2010). Pada masa ini, Malaysia melaksanakan Dasar Transformasi Negara (NTP), dalam usaha untuk bergerak ke arah sebuah negara berpendapatan tinggi. Pelbagai usaha telah dilaksanakan oleh kerajaan untuk mengatasi masalah kemiskinan dengan kejayaan yang ketara. Walau bagaimanapun, kemiskinan masih berterusan di beberapa negeri, termasuk Wilayah Ekonomi Pantai Timur (ECER) yang terdiri daripada tiga negeri utama di pantai timur iaitu Kelantan, Terengganu dan Pahang. Kajian ini bertujuan untuk mengenal pasti ciri-ciri miskin tegar dan miskin di negeri Terengganu melalui pemetaan kemiskinan. Kajian ini menggunakan data sekunder dari Unit Penyelarasan Pelaksanaan (ICU) melalui sistem portal e-Kasih yang terdiri daripada 368 ketua isi rumah miskin tegar dan 7219 isi rumah miskin di Terengganu didaftarkan dalam tempoh dari 2008 hingga Ogos 2011. Kajian ini menggunakan perisian ArcGIS untuk memetakan kawasan isi rumah miskin tegar dan miskin. Hasil kajian telah menunjukkan bahawa golongan miskin kebanyakannya bertumpu di Besut dan Kuala Terengganu, ibu negeri Terengganu. Secara keseluruhan, ciri-ciri yang tidak menguntungkan seperti pendidikan yang rendah, bilangan ahli keluarga yang ramai dan melibatkan diri dalam pekerjaan berpendapatan rendah memberikan cabaran kepada agensi-agensi kerajaan untuk menyediakan bantuan yang sewajarnya kepada mereka. Implikasi dasar akan dibincangkan untuk meningkatkan kejayaan pelaksanaan program pembasmian kemiskinan melalui transformasi ekonomi bagi memacu negara mencapai negara berpendapatan tinggi, meningkatkan kualiti hidup rakyat dan pembangunan mampan di negeri Terengganu.

Kata kunci: Miskin tegar; miskin; analisis kemiskinan; pemetaan kemiskinan; GIS, kehidupan mampan

INTRODUCTION

Poverty is defined variously as hunger, lack of opportunity, lack of options, education, health, productive assets, susceptible to risks and vulnerability. Every welfare state has this basis of reducing poverty and attaining development (World Bank 2005). In Malaysia, poverty is commonly conceptualized and operationalized from the monetary approach perspective. According to Chamhuri Siwar (2001), poverty is a multi-dimensional phenomenon. The phenomenon of poverty can be seen from various dimensions including the economic, social, religious, education, health, temporal, space, gender, and environment. Economists have argued that the current monetary approach is not able to reflect the multidimensional nature of poverty, which has developed due to the rapid economic development process via globalization and liberations of trade and businesses. Malaysia has formulated a range of policies and plans to guide the management of national development during 1970s such as New Economic Policy (1970-1990), then National Development Policy (1991-2000) and followed by National Vision Policy (2001-2010), has been devised to address economics imbalances and eradicate poverty. These policies have succeeded in maintaining economic growth of the country (Ali et al. 2009).

The poverty reduction has become the important agenda for the government by trying to improve on the poverty targets set through the Millennium Development Goals (MDGs). According to Eleventh Malaysia Plan 2016-2020 (Malaysia 2015), the success of Malaysia's poverty eradication programs is evidenced by the sharp decline in the incidence of poverty, which decreased from 49.3% in 1970 to 3.8% in 2009 and recently 0.6% in 2014. It also set ambitious targets to narrow income disparities and improve equity. In 2007, the government has developed the *e-Kasih* system which contained the complete information of the poor family nationwide. This system is to help government in planning, implementing, and monitoring the poverty eradication programs.

The government requires a comprehensive mechanism to ensure that poverty problem can be solved effectively. In this respect, Malaysia has begun to explore the geographical disparities in poverty rates within the country through an emerging concept known as poverty mapping which has become one of the important methods to

prevent poverty problems in developing countries (Koh 2009), and can also be used to inform formula for fiscal transfers that accompany decentralization of responsibilities (Henninger and Snel 2000). Poverty mapping is a method to combine survey and census data to estimate income inequality through geographical factors. This is because at present the main problem for reaching out to the poor in addressing their specific needs, require poverty statistics at smaller geographical disaggregation: the state, counties and parishes. It also to identify the poor and their needs, data on their social situation is important.

Poverty maps are important tools for geographical targeting where resources are directed towards areas that have been identified as poor (Baker and Grosh (1994), Bigman and Deichmann (2000). Geographical targeting requires relatively low administrative costs. Therefore, rather than relying on a single aggregate or an estimated welfare indicator, a comprehensive poverty measure can be compared against regional patterns of other economic, social or biophysical indicators. Geographical Information System (GIS) database contains information not only on the value of social, economic, climatic, and environmental observations, but also on the location and spatial arrangements (Bigman and Fofack 2000). GIS in poverty mapping could be used not only to visualize spatial data in the form of maps but also as a tool to extract information from datasets (Henninger and Snel 2000). GIS also needed for developing data visualization methods, as these are easily understandable by non-specialists rather than the numeric or statistical formats. This would encourage a wider participation of users in spatial data interpretation.

Poverty maps are important source of information on the regional distribution of poverty and are currently used to support regional policy making and to allocate fund to local jurisdictions (Guadrrama et al. 2014). Therefore, it becomes important for Department of Statistics Malaysia to use Geographical Information System (GIS) to improve and combine more additional variables on the map as outlined in the Strategic Plan 2010-2014 (Malaysia 2010). Moreover, the country is currently adopting poverty mapping strategies to estimate the poverty rate at a smaller area such as districts and sub-districts to identify the pockets of poverty (Muhammed and Haron 2011).

However, despite achieving commendable progress in reducing the incidence of poverty in

Malaysia during the last few decades, poverty continues to be a major development concern in the country (Nair 2010). There still remain pockets of poverty in different states of the country. Nowadays, the rate of poverty is high in poor states such as Sabah (4.0%) Kelantan (0.9%), and Sarawak (0.9%) (Malaysia 2015). The aim of this study is to identify the characteristics of hard-core poor and poor in the state of Terengganu through poverty mapping. The study also aims to examine the association of poverty status of the households with their socio-demographics characteristics in the state.

METHODOLOGY

STUDY AREA

In this study, Terengganu state is selected to map the locality of hard-core poor and poor households (Figure 1). It is located on the east coast of Peninsular Malaysia at the latitude of 04° 00'N - 05° 50'N and the longitude of 102° 25'E - 103°50'E. The state has a total area of 1,295,638.3 hectares. It comprises of 7 districts, namely Besut, Dungun, Hulu Terengganu, Kemaman, Kuala Terengganu, Marang, and Setiu. The population of 40063 consists of four main ethnic groups, namely Malay (99.63%), Chinese (0.26%), Indian (0.05%), and others (0.05%). Terengganu showed a reduction of poverty rate with a decrease from 4.0% in 2009 to 0.6% in 2014 (Malaysia 2015). However, the coastal communities especially the fishermen, are still among the lowest income communities that are poor and marginalized (Nor Hayati Sa'at 2011).

MAP OF TERENGGANU STATE

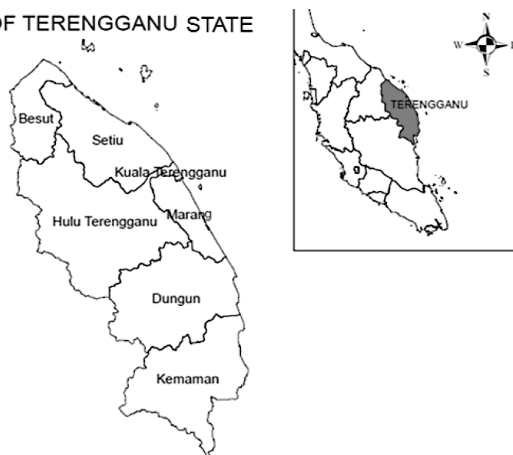


FIGURE 1. Map of Terengganu

MATERIAL AND METHODS

In this study, secondary data was used to map the locality of the hard-core and poor households in the state of Terengganu. The data was obtained from the Implementation and Coordination Unit (ICU) via the *e-Kasih* portal system, consisting of 368 heads of hard-core poor households and 7219 heads of poor households in Terengganu registered during the period of 2008 to August 2011. The data for evaluating and explaining the groups of poverty in Terengganu consisted of 7 districts (Figure 2). ArcGIS 9.3 was used to map the locality of the hard-core poor and poor households in Terengganu. The poverty status is categorized into two groups namely the hard-core poor and poor. The former consists of households with incomes that are lower than the food poverty line. The food poverty line is based on the daily needs of each individual according to the food calorie recommendation of the PLI 2014 methodology. The latter group consists of those with incomes of less than RM930.00 in Peninsular Malaysia, RM1170.00 for Sabah, and RM990.00 for Sarawak (Malaysia 2015).

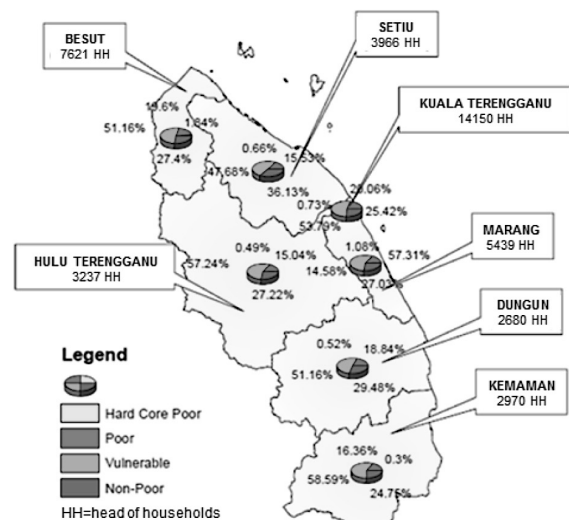


FIGURE 2. Distribution of poverty status by districts in Terengganu

Table 1 shows the distribution of the hard-core poor and poor by districts in Terengganu. The result shows that two out of seven districts experienced high incidence of poverty above 20%, namely in the districts of Besut and Kuala Terengganu which is 21.4% and 20.8%. Meanwhile, the rest of the districts have a range of 20% and below.

TABLE 1. The distribution of hard core poor and poor by districts in Terengganu

District	KIR	Poverty Status		Total KIR	Percentage of Poverty (%)
		Hard Core Poor (%)	Poor (%)		
Besut	1634	140 (1.84)	1494 (19.60) ²	7621	21.44
Dungun	519	14 (0.52)	505 (18.84) ³	2680	19.37
Hulu Terengganu	503	16 (0.49)	487 (15.04) ⁶	3237	15.54
Kemaman	495	9 (0.30)	486 (16.36) ⁴	2970	16.67
Kuala Terengganu	2942	104 (0.73)	2838 (20.06) ¹	14150	20.79
Marang	852	59 (1.08)	793 (14.58) ⁷	5439	15.66
Setiu	642	26 (0.66)	616 (15.53) ⁵	3966	16.19
Total	7587	368 (0.92)	7219 (18.02)	40063	18.94

Source: Tabulated by authors from ICU E-kasih data base, 2011

The identification of the ‘pocket of poverty’ or the low-income areas and the surrounding areas is based on the Household Income Survey (HIS) conducted by the Department of Statistics of Malaysia. However, the indigenous people, FELDA settlements, and estates that have their own administration have been excluded (ICU 2011).

RESULT AND DISCUSSION

The distribution of the poverty status by district for the entire state of Terengganu is shown in Figure 2. The distribution of poverty by district in Terengganu indicates that most of the hard-core poor respondents are centered in Besut at 38.0%. The highest number of hard core poor in the urban areas is in the state’s capital, Kuala Terengganu, with a rate of 67.2%, followed by Besut at 11.7%, and Marang at 9.5%. Meanwhile, the hard-core poor in the rural areas is concentrated in Besut at 53.7%, followed by Marang at 19.9%, and Setiu at 9.5%. In addition, the highest number of poor in the urban areas is in the state’s capital, Kuala Terengganu, with a rate of 61.7%, followed by Kemaman at 8.7%, and Besut at 7.1% while the poor in the rural areas is concentrated in Besut at 37.6%, followed by Marang at 16.0%, and Setiu at 13.8%.

POVERTY AND EDUCATION

Education levels have been grouped into four major categories which are secondary school and above (postgraduate university/college/polytechnic), medium level (GCE/O-Level/Vocational/Technical school/Form 4-5/Form 1-3), Primary School and below (Primary/Pre-school), and no schooling.

Table 1 shows the level of education by poverty status among the heads of hard-core poor and poor households in Terengganu. Subsequently, the results show that a majority of heads of households have completed secondary school and above. This is followed by the medium level, primary school and below, and no schooling categories (refer Figure 3 (a-b)). Among the hard-core poor and poor in urban and rural areas in this study, most have had a medium level of education, followed by primary school and below. Therefore, more than half of the respondents from both categories lack education as they have only had primary school education. This is a common characteristic among the poor as proven by (Bigsten, Kebede, Shimeles, & Tadesse 2003) and according to Njong (2010), educational attainment is a critical determinant factor and a major tool in implementing poverty reduction programs.

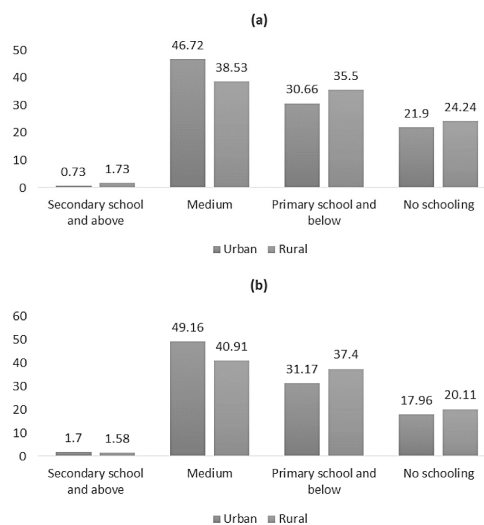


FIGURE 3. (a-b): Residential distribution of (a) hard-core poor and (b) poor households by level of education in Terengganu

POVERTY AND OCCUPATION

The occupational level is an important determinant of the socioeconomic status of the population. This study reviewed seven categories of occupation namely self-employed jobs, salaried workers, students and retirees, housewife, unemployed, and others. However, for this study, job categories have been classified into three main categories: salaried, self-employed, and other jobs. The overall categories of occupation that the respondents are engaged in are salaried employment at 23.6%, followed by self-employed at 22.3%, and 54.2% had other jobs (Figure 4 (a-b)). A majority of the hard-core poor in the urban areas are self-employed and have other jobs at 35.0%; within this percentage, 31.4% were unemployed. Furthermore, in the rural areas, most of the hard-core poor are self-employed at 30.3%, followed by 43.7%, and 26.0% who have other jobs and salaried employment, respectively. It is also shown that 20.3% of heads of poor households in urban areas and 17.4% of those in rural areas have no jobs. This study found that in general, the macroeconomic problems still emerge

among the poor and hard-core poor based on strata in Terengganu.

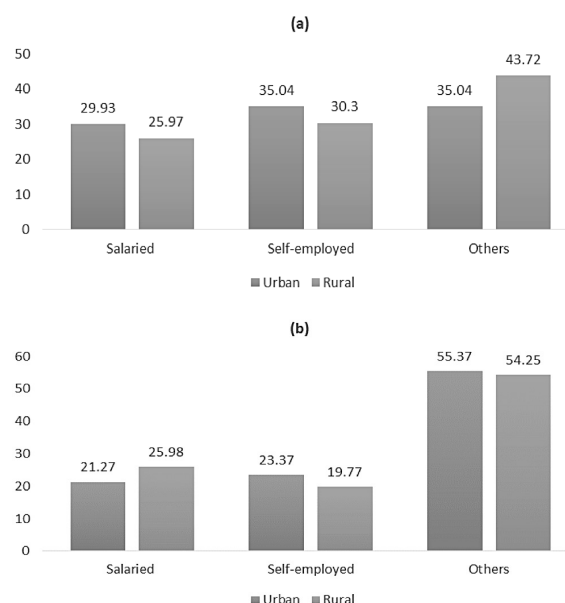


FIGURE 4. (a-b): Residential distribution of (a) hard-core poor and (b) poor households by occupation in Terengganu

TABLE 2. Distribution of education level and occupation by poverty status in Terengganu

Education/ Occupation	Secondary school and above		Medium		Primary school and below		No schooling		Total	
	HCP	P	HCP	P	HCP	P	HCP	P	HCP	P
Salaried	2 (40)	64 (53.8)	77 (50.3)	2225 (67.8)	54 (43.6)	1319 (53.8)	16 (18.6)	353 (25.8)	149 (40.5)	3961 (54.9)
Self-employed	2 (40)	40 (40)	46 (30.1)	832 (25.3)	42 (33.9)	622 (25.4)	11 (12.8)	193 (14.1)	101 (27.5)	1687 (23.4)
Others	1 (20)	15 (12.6)	30 (19.6)	226 (6.9)	28 (22.6)	510 (20.8)	59 (68.6)	820 (60.0)	118 (32.1)	1571 (21.8)
Total	5 (100)	119 (100)	153 (100)	3283 (100)	124 (100)	2451 (100)	86 (100)	1366 (100)	368 (100)	7219 (100)

Source: Tabulated by authors from ICU E-kasih data base, 2011

TABULATION OF EDUCATION AND OCCUPATION

Table 2 presents the crosstab between education and occupation for hard-core poor and poor in Terengganu. The distribution of hard-core poor indicate that a majority of heads of households with a medium level of education are engaged in salaried employment at about 50.3%. However, a majority of heads of households with primary school and below level of education are also engaged in

salaried employment. In addition, more than half of the heads of households with no schooling at 68.6% are engaged in other occupations. Furthermore, the distribution of crosstab between education and occupation for the poor in Terengganu indicates that majority of heads of households with secondary and above level of education are engaged in salaried employment at about 53.8%. Similarly, the result also found that more than half of those with a medium level education are engaged in salaried employment at about 67.8%. Meanwhile, more

than half of the heads of households at 60.0% with no schooling are engaged in other occupations and majority of them are unemployed at about 54.7%.

The mapping of education and occupation distribution for hard core poor and poor by districts in Terengganu are shown in Figure 5. The study indicates that the hard-core poor with a medium level of education were mainly found in Kuala Terengganu and Besut with the percentage of 28.6% and 45.5%, respectively. A majority of heads of households in Besut are engaged as a salaried employee (56.45%), followed by self-employed (30.7%), and other jobs (12.9%). Meanwhile, the poor category with a medium level of education was also found in Kuala Terengganu and Besut at about 44.1% and 20.2%, respectively. The study also found that a majority of heads of households in Kuala Terengganu are engaged in salaried employment at about 69.5%, followed by self-employed at 23.3%, and other jobs at 7.3%. In addition, a majority of heads of households in Besut are engaged in salaried employment at 66.1% followed by those who are self-employed at 28.4%. The distribution of the hard-core poor in urban and rural areas with a medium education level is presented in Table 3. The results of the numerical simulation indicate that those with salaried employment are dominantly found in urban and rural areas with the percentage of 45.3%, and 53.9%, respectively. More than half of the hard-core poor in rural areas are involved in this category compared to those in the urban areas. However, the main feature of the poor and hard-core poor in Malaysia, especially in Kuala Terengganu, is still focused on the poorly educated, where more than 70 percent are engaged in other occupations that produce lower returns. Therefore, training and skills programs to improve the income of this group should be given attention in order to achieve a high-income nation.

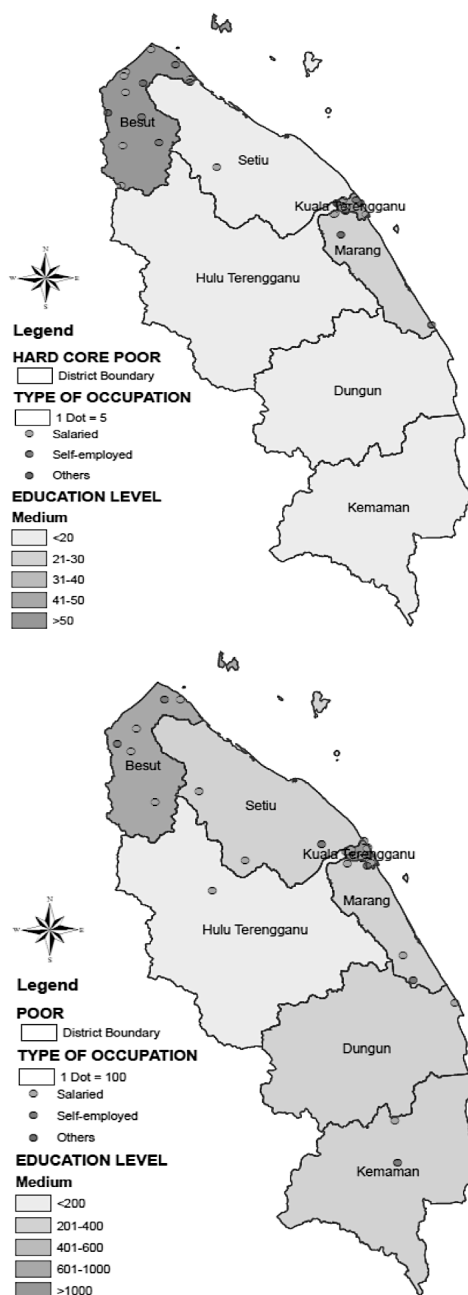


FIGURE 5. Distribution of education and occupation by district in Terengganu

TABLE 3. Types of occupation with medium education level in urban and rural area for hard core poor and poor in Terengganu

Occupation	Urban		Rural		Total
	Hard-core Poor	Poor	Hard-core Poor	Poor	
Salaried	29(45.31)	1343(68.35)	48(53.93)	882(66.92)	2302
Self-employed	22(34.38)	471(23.97)	24(26.97)	361(27.39)	878
Others	13(20.31)	151(7.68)	17(19.10)	75(5.69)	256
Total	64(100)	1965(100)	89(100)	1318(100)	3436

Source: Tabulated by authors from ICU E-kasih data base, 2011

CONCLUSION

In conclusion, the majority of heads of households for the hard-core poor and poor in Terengganu have a medium education level with the percentage of 43.7% and 45.5%, respectively. For the hard-core poor category, those with a medium education level are mainly located at Besut and Kuala Terengganu with the percentage of 28.6% and 45.5%, respectively. Similarly, for the poor category, those with a medium education level are mostly located at Kuala Terengganu and Besut with the percentage of 44.1% and 20.2%, respectively. Meanwhile, the majority of hard-core poor in urban areas have salaried employment with the percentage of 45.3%, followed by self-employed at 34.4%, and other jobs at 20.3%. Similar patterns are also found in the rural areas with salaried employment at about 53.9%, followed by self-employed at 27.0%, and other jobs at 19.1%. It is quite surprising that a majority of those who are salaried employees in the hard-core poor category come from the rural areas with the percentage of 62.3% compared to the urban areas, which has only 37.7%. The possible reason is due to the number of household members. However, unemployment still happens in both areas due to lack of knowledge and low educational levels. Thus, the introduction of intensive training and income generating programs are needed in order to improve the country's competitiveness at the international level. This study has identified and characterized the hard-core poor and poor in the state of Terengganu and this would be useful for policy makers to target intervention at the domestic level and to monitor and evaluate the effectiveness of projects and policy interventions geared towards the poor.

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